What is claimed is:

1. A software receiver comprising:

a receiver capable of receiving a radio signal;

means for digitizing the radio signal; and

a software correlator capable of mixing the digitized radio signal to form a baseband signal using bit-wise parallelism.

2. The software receiver of claim 1 wherein said software correlator comprises:

means for computing correlations between the baseband signal and at least one pseudo-random number (PRN) code using the bit-wise parallelism.

3. The software receiver of claim 2 wherein said software correlator further comprises:

means for computing accumulations from the correlations using the bit-wise parallelism.

4. The software receiver of claim 3 further comprising:

application-specific code capable of computing navigation data using the accumulations.

5. The software receiver of claim 1 wherein said means for digitizing comprises:

means for down-converting the radio signal to an intermediate frequency; and

a digitizer capable of digitizing the intermediate frequency.

6. The software receiver of claim 5 wherein said digitizer produces at least one bit/sample.

7. The software receiver of claim 5 wherein said digitizer is an analog to digital converter.

8. A method for processing at least one radio frequency (RF) signal over an accumulation period comprising the steps of:

receiving at least one RF signal;

mixing the at least one RF signal to form a baseband mixed signal using bit-wise parallelism;

computing a fully mixed prompt integrand as a function of the baseband mixed signal and a pre-selected pseudo-random number (PRN) code using the bit-wise parallelism;

computing a fully mixed early-minus-late integrand as a function of the baseband mixed signal and the pre-selected PRN code using the bit-wise parallelism;

computing in-phase and quadrature summed accumulations over the accumulation period, the in-phase accumulation and quadrature summed accumulations being functions of the fully mixed prompt integrand and the fully mixed early-minus-late integrand; and

rotating the in-phase and quadrature summed accumulations to correct for effects of frequency and phase granularity of the baseband mixed signal.

9. A method for computing prompt and early-minus-late in-phase and quadrature summed accumulations for a plurality of signals from a plurality of channels comprising the steps of:

representing a carrier replica signal from the at least one channel from the plurality of channels as a carrier replica sign and a carrier replica magnitude;

representing signal data from the at least one channel of the plurality of channels as at least one signal word;

computing a baseband mixed sign as a function of the carrier replica sign and the at least one signal word;

computing a baseband mixed magnitude as a function of the carrier replica magnitude;

selecting a pseudo-random number (PRN) code having a prompt PRN code and an early-minus-late PRN code;

representing the prompt PRN code as a prompt PRN code sign;

computing a fully mixed prompt integrand sign as a function of the baseband mixed sign and the prompt PRN code sign;

representing the early-minus-late PRN code as an early-minus-late PRN code sign and an early-minus-late PRN code zero mask;

computing a fully mixed early-minus-late integrand sign as a function of the baseband mixed sign and the early-minus-late PRN code sign;

computing at least one set of prompt integrand value words as a function of the fully mixed prompt integrand sign and the baseband mixed magnitude;

computing at least one set of early-minus-late integrand value words as a function of the fully mixed early-minus-late integrand sign, the baseband mixed magnitude, and early-minus-late PRN code zero mask;

computing prompt in-phase and quadrature summed accumulations for the plurality of channels for an accumulation interval as functions of the number of significant bits in the at least one set of prompt integrand value words and as functions of the values associated with the at least one set of prompt integrand value words; and

computing early-minus-late in-phase and quadrature summed accumulations for the plurality of channels as functions of the number of significant bits in the at least one set of early-minus-late integrand value words and as functions of the values associated with the at least one set of early-minus-late integrand value words.

10. The method of claim 9 further comprising the step of:

selecting the significant bits from a group consisting of zeros and ones.

11. The method of claim 9 further comprising the step of:

retrieving the carrier replica signal from a carrier replica table, the carrier replica table representing a coarse grid of frequencies.

12. The method of claim 9 further comprising the step of:

representing the signal word from the at least one channel as a signal sign and a signal magnitude; and

computing at least one baseband mixed magnitude as a function of the carrier replica magnitude and the signal magnitude.

13. The method of claim 12 further comprising the step of:

retrieving the carrier replica signal from a carrier replica table, the carrier replica table representing a coarse grid of frequencies.

14. A software receiver comprising:

a front-end device capable of receiving a radio signal, said front-end device capable of converting the radio signal into signal data;

a data acquisition device capable of receiving the signal data, said data acquisition device capable of providing the signal data to a microprocessor;

at least one shift register capable of packing the signal data into at least one data word;

a baseband mixer capable of computing at least one baseband mixed signal as a function of the at least one data word by using bit-wise parallel processing;

a correlator capable of computing correlations between the baseband mixed signal and a pseudo-random number (PRN) code replica signal; and

an accumulator capable of computing summed accumulations by accumulating the correlations.

15. The software receiver of claim 14 wherein the signal data further comprises a signal sign.

16. The software receiver of claim 14 wherein the signal data further comprises a signal sign and at least one signal magnitude.

17. The software receiver of claim 14 wherein said correlator uses the bit-wise parallel processing for computing the correlations.

18. The software receiver of claim 14 wherein said accumulator accumulates the correlations by an electronic mechanism.

19. The software receiver of claim 14 wherein the radio signal can be received from a global positioning source.

20. The software receiver of claim 14 wherein said correlator can be adapted to perform functions selected from a group consisting of accepting the radio signal at any frequency, accepting any PRN code, and accepting the radio signal from any device that generates a radio signal.

21. A method for generating over-sampled prompt and early-minus-late pseudo-random number (PRN) codes in a bit-wise parallel format comprising the steps of:

formulating a tabulated function for use in translating code chip and timing information into over-sampled prompt and early-minus-late PRN code in the bit-wise parallel format;

generating at least one prompt PRN code in real-time;

choosing at least one chip value from the at least one prompt PRN code, the at least one chip value corresponding to at least one data interval that contains at least one sample of a data word, the at least one chip value having a known timing relative to the at least one data interval;

transforming the relative timing into a time grid index; and

translating the at least one chip value and the time grid index during the at least one data interval into the over-sampled prompt and early-minus-late PRN codes in bit-wise parallel format for the at least one data interval, said step of translating resulting from the use of the tabulated function.

22. The method of claim 21 further comprising the step of:

computing the time grid index as a function of a time offset index k_v and an auxiliary table index μ_v.

23. The method of claim 21 further comprising the step of:

computing the time grid index iteratively as a function of a previously-computed time grid index, the at least one prompt PRN code, and timing values associated with the at least one prompt PRN code.

24. A method for using over-sampled prompt and early-minus-late pseudo-random number (PRN) code replica data words that are stored in a bit-wise parallel representation in a pre-computed table consisting of the steps of:

selecting the over-sampled prompt and early-minus-late PRN code based on over-sampled prompt and early-minus-late PRN code start time as measured relative to an RF data sample time, said step of selecting substantially matching the midpoint of the over-sampled prompt and early-minus-late PRN code with a desired PRN code midpoint; and

bit-shifting the over-sampled prompt and early-minus-late PRN code data words, said step of bit-shifting insuring that the over-sampled prompt and early-minus-late PRN code start time corresponds with a pre-selected sample interval.

25. A method for tracking the phase of a pseudo-random number (PRN) code to track the timing of its chips comprising the steps of:

latching PRN code phase, carrier phase, epoch counters, and carrier frequencies at a pre-specified time;

computing a pseudo range using the PRN code phase and the epoch counters;

tracking and updating the PRN code phase and the carrier phase by estimating code chipping rate and carrier Doppler shift inputs; and

computing the PRN code phase at the pre-specified time as a function of the updated code chipping rate and the pre-specified time.

26. A node in a computer network capable of carrying out the method according to claim 8.

27. A communications network comprising at least one node for carrying out the method according to claim 8.

28. A computer data signal embodied in electromagnetic signals traveling over a computer network carrying information capable of causing a computer system in the network to practice the method of claim 8.

29. A computer readable medium having instructions embodied therein for the practice of the method of claim 8.